IR Number 1.2.41 **(Source: KTFN)**

Preamble

As the regulators and reviewers of this project, the above organizations have a responsibility to approve Paramount's selected access and pipeline routes.

Request

Please provide the MVEIRB with the following information:

a) *Explain the criteria, and criteria weighting, that your organization considers acceptable for use by Paramount in selecting access and pipeline routes.*

Response

This I.R. was addressed to INAC and GNWT.

IR Number 1.2.42 **(Source: KTFN)**

Preamble

Paramount says that if heritage resources are discovered, work will continue in other unaffected areas

Request

Please provide the MVEIRB with the following information:

a) Indicate the minimum radius around the heritage discovery within which work will not proceed until further study has been completed.

b) Explain the basis for the minimum radius around the heritage discovery within which work will not proceed until further study has been completed.

Response

a) As stated in the *Summary of Legislation Protecting Heritage Resources in the Northwest Territories* (PWNHC no date), sections 6(a) and 12 of the Mackenzie Valley Land Use Regulations state:

> 6(a). Unless expressly authorized by a permit or in writing by an inspector, no permittee shall conduct a land use operation with 30 m of a known monument or a known or suspected historical, archaeological site or burial ground; and
>
> 12. Where, in the course of a land use operation, a suspected historical or archaeological site or burial ground is discovered,
> (a) the permittee shall immediately suspend operations on the site or burial ground and notify the Board or inspector; and
> (b) the Board or inspector shall notify any affected First Nation and the department of the Government of the Northwest Territories responsible therefore of the location of the site or burial ground and consult them regarding the nature of the materials, structures or artifacts and any further actions to be taken.

Therefore, while a minimum distance of 30 m is specified in the regulations, a greater distance may be implemented following a review of the significance of the location by the affected First Nation and/or the Government of the Northwest Territories. However, all work will cease at the location until the situation has been reviewed and appropriate buffer zones have been set.

b) No two heritage resource locations are completely alike. Whether a site is large or small, the responsible management of heritage resources is highly dependent on the careful review of a number of variables. These variables include, not only the age, size and type of site, but also its integrity and its cultural relevance.

IR Number 1.2.43 **(Source: KTFN)**

Preamble

Paramount says that the size and volume of the trees that will be cut down, in conjunction with the travel distance may reduce the economic viability of salvaging timber.

Paramount also says that excess timber not rolled-back or used for corduroy will be decked, and the appropriate companies notified of the volume and location.

Request

Please provide the MVEIRB with the following information:

a) *Identify what, if any, authorizations Paramount will require from the GNWT to allow it to cut down trees.*

b) *Provide the GNWT's analysis on the economic viability of salvaging trees cut down in the Cameron Hills by Paramount.*

c) *Identify under what authority Paramount is permitted to use the trees that it cuts down for its own purposes, such as the construction of corduroy roads.*

d) *What are the GNWT's requirements for Paramount paying for the right to cut down trees, to salvage merchantable timber, to pay to use trees for its own purposes and to replant the areas that have been cleared?*

Response

This I.R. was addressed to the GNWT.

IR Number 1.2.44 (Source: KTFN)

Preamble

Paramount says that rutting to a depth of 30 cm will be permitted.

Request

Please provide the MVEIRB with the following information:

a) Explain Paramount's rationale for a 30 cm rutting depth being the acceptable maximum.

Response

a) This precise question was asked in EA01-005. While Paramount practises adaptive management, it has gained no new knowledge to cause it to amend its position regarding this issue. Simply put, Paramount has not worked soft ground conditions to precipitate rutting to the extent considered by the question. Paramount recites its previous response as follows:

"As stated in Sections 4.1 of the Environmental Impact Assessment for the Cameron Hills Gathering System and Facilities Project ("Gathering System EIA") and page 31 of the Mackenzie Valley Land and Water Board ("MVLWB") Cameron Hills Land Use and Water License Application Clarifications ("Land Use and Water License Clarifications"), mitigative measures will be implemented prior to reaching the 30 cm rutting depth. The mitigative measures would include the scheduling of construction during early morning or evening frost, the use of low ground pressure equipment (e.g. wide pad, track equipment), or postponing or suspending construction activities until ground conditions improve.

The rutting will be assessed in regards to the potential for erosion (e.g. if it is on a hill) and the impact to revegetation due to overcompaction, pooling of water, or the admixing of soils. If these issues occur then mitigative measures outlined in the Gathering System EIA will be implemented.

The 30 cm rutting depth was chosen to quantify a maximum limit to the acceptable depression onto the ground surface. Further, the potential for rutting is expected to be higher where organic soils are crossed by the ROW and when the weather conditions promote thawing (i.e. warm temperatures). In these areas, the top 30 cm is typically continuous organic material which would not be prone to admixing as it is the same material at different stages of deposition. Zero rutting is not practical since some surfaces can easily soften during a moderately cool but sunny late winter day. Paramount feels that 30 cm would be a depth that would limit any negative

environmental impact and yet it is not a depth that can't be remediated or mitigated if erosion or revegetation issues arise."

IR Number 1.2.45 **(Source: KTFN)**

Preamble

Paramount provides a breakdown of the species content of Certified Canada Seed #1.

Paramount says that rutting to a depth of 30 cm will be permitted.

Request

Please provide the MVEIRB with the following information:

a) Are the species identified indigenous to the project area?

b) What is your organization's policy on the use of non-indigenous plant species?

c) Are there any concerns with the species that have been identified?

d) What is your organization's policy on acceptable rutting depth?

Response

This I.R. was addressed to the GNWT and INAC and EC.

IR Number 1.2.46 **(Source: KTFN)**

Preamble

Paramount says that existing linear disturbances will be used whenever practical.

Request

Please provide the MVEIRB with the following information:

a) For the 2001 field season and for the proposed application case, please identify the percentage of existing disturbance that was or will be utilized by Paramount when constructing new access and pipeline routes.

b) For the 2002 field season and for the proposed application case, please identify the percentage of existing disturbance that was or will be utilized by Paramount when constructing new access and pipeline routes.

c) For the 2003 field season and for the proposed application case, please identify the percentage of existing disturbance that was or will be utilized by Paramount when constructing new access and pipeline routes.

Response

a) No new wells were drilled, and no pipeline was constructed in the 2000/2001 field season, therefore no new access was required.

b) For the 2001/2002 field season, approximately 4426 m of access was required for new wells, and no new cut was required; therefore, 100% of the access was on an existing disturbance corridor. In 2001/2002, 60210 m of pipeline and related access were required, and 20737 m of new cut was required; therefore, 65. 6% of this project component was located on existing disturbance.

c) For the 2002/2003 field season, approximately 6146 m of access was required for new wells, and no new cut was required; therefore, 100% of the access was on an existing disturbance corridor. In 2002/2003, 7176 m of pipeline and related access were required, and no new cut was required; therefore, 100% of this project component was located on existing disturbance.

For the access wells and pipelines presented in the Application Case, 21481 m of right-of-way would be required, all of which has been routed on existing disturbance corridors; therefore, use of existing disturbance is 100%.

IR Number 1.2.47 **(Source: KTFN)**

Preamble

Paramount refers to a November 2002 Golder report titled "Erosion Survey and Mitigation Plan for the Cameron Hills Gathering System and Pipeline".

Request

Please provide a copy of this report.

Response

a) Copies of the Golder Report " Erosion Survey and Mitigation Plan for the Cameron Hills Gathering System and Pipeline" were distributed to the Mackenzie Valley Land & Water Board, Government of the Northwest Territories as well as federal government agencies (National Energy Board, Fisheries & Oceans Canada, Indian and Northern Affairs Canada, and Environment Canada). A copy of the above mentioned report is being submitted to the MVEIRB for their public registry in support of this EA.

IR Number 1.2.48 **(Source: KTFN)**

Preamble

Paramount refers to an "Environmental Protection Plan Manual".

Request

Please provide a copy of this manual.

Response

Six copies of the Northern Region Cameron Hills Area N.W.T. January 2002 'Environmental Protection Plan Manual" were sent to the NEB. One copy of this report is being submitted to the MVEIRB for their public registry in support of this IR.

IR Number 1.2.49 **(Source: KTFN)**

Preamble

Paramount proposes windrow breaks every 400 m of at least 10 m in length to minimize the potential wicking effect during forest fires and to promote wildlife movement.

Paramount says that it will notify the NEB, MVLWB and/or INAC when an archaeological site is found. Paramount does not mention contacting the Ka'a'Gee Tu First Nation.

Paramount says it will not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging. This seems to contradict Paramount's previous statement that 30 cm was the maximum acceptable for rutting.

Request

Please provide the MVEIRB with the following information:

a) What is the basis for Paramount concluding that the proposed windrow spacing is sufficient to achieve the dual purposes cited by Paramount?

b) Please clarify whether or not Paramount will notify the KTFN when an archaeological site is found.

c) If not, please explain why.

d) Clarify Paramount's contradictory statements regarding acceptable rutting depth.

Response

a) The length of the windrow and the size of the break is a condition of a land use permit. It should be noted that the dimensions quoted do vary from one forest region to another.

b) / c)
Pursuant to the Mackenzie Valley Land Use Regulation (MVLUR) and the Canada Oil and Gas Geophysical Operations Regulations (COGGOR), Paramount must stop all work if a suspected historical or archaeological site or burial ground is discovered and reported to the Board or an inspector (MVLUR) and a conservation officer (COGGOR). Under MVLUR, the Board or inspector shall notify the KTFN if the KTFN is the affected First Nation.

d) Different activities have different effects on the landscape surface. For this project, seismic operations which are conducted in the winter will use heavy equipment (vibrators) buggy-mounted on low pressure tires and other low ground pressure vehicles, 4x4 trucks, tracked units, quads and snowmobiles to move personnel and equipment as well as acquire data. If there is even a potential for rutting and damage to the vegetation mat, operations will be suspended.

For activities involving heavier equipment such as the movement of drilling rigs or the construction of pipelines, some rutting may occur but Paramount will limit that rutting to 30 cm depth. The 30cm rutting depth was chosen to quantify a maximum limit for acceptable depression onto the ground surface that can be remediated or mitigated if erosion or revegetation issues arise. The potential for rutting is expected to be higher where organic soils are crossed by the ROW and when the weather conditions promote thawing (i.e. warm temperatures). Paramount feels that 30 cm would be a depth that would limit any negative environmental impact.

Refer to IR 1.2.44 for details.

IR Number 1.2.50 **(Source: KTFN)**

Preamble

Paramount proposes windrow breaks every 400 m of at least 10 m in length to minimize the potential wicking effect during forest fires and to promote wildlife movement.

Request

Please provide the MVEIRB with the following information:

a) *Explain whether your or not your organization agrees that the proposed windrow break spacing is sufficient to achieve the dual purposes stated by Paramount.*

b) *If no, then what does your organization believe is the minimum acceptable spacing for windrow breaks.*

c) *Provide the rationale for your proposed spacing.*

Response

This I.R. was addressed to the GNWT and EC.

IR Number 1.2.51 (Source: KTFN)

Preamble

Paramount is proposing to dispose of drill cuttings in remote pits.

Request

Please provide the MVEIRB with the following information:

a) *Summarize any information or research that Environment Canada has as to the effectiveness of remote pits to contain contaminants in drill cuttings.*

b) *Describe any concerns that Environment Canada has with regards to Paramount's proposed method of disposing of drill cuttings as described in the DAR and in Paramount's responses to IR 1.1.17 and IR 1.1.35.*

Response

This I.R. was addressed to EC.

IR Number 1.2.52 (Source: KTFN)

Preamble

With regards to the disposal of drilling fluids, Paramount states that: "These types of practices have their own set of risks, benefits, and the costs are prohibitive that Paramount feels are not warranted for application in the Cameron Hills."

Request

Please provide the MVEIRB with the following information:

a) The analysis that supports the above statement.

Response

a) Downhole disposal of drilling fluids is a technique that is used in certain situations where conventional disposal methods are not feasible. There are many risks associated with any downhole disposal program. There is geological risk that a suitable disposal zone will not be found in the area. To dispose of fluids downhole a non-productive porous and permeable zone must be found that will accept the injection of the fluids at pressures less than the fracture gradient. Not all areas have a suitable zone for injection. No zone has yet been identified or tested in the Cameron Hills area. There is a risk that the injection zone will plug off after being injected into for a period time. This situation can sometimes be reversed with a workover to stimulate the zone but in some cases it can be irreversible. There is a risk that downhole equipment such as packers and tubing can develop leaks that also would require workovers to repair. Surface equipment can break down, fluids for disposal must be transported to the injection location, and there is a risk that the disposal proposal will not receive regulatory approvals.

The benefit of downhole disposal is that the fluids do not need to be treated, mixed, or buried. No pits have to be dug and other than the disposal wellsite, roads, and pipelines to the wellsite the ground does not have to be disturbed.

The costs associated with a downhole disposal plan make it prohibitive in comparison to the mix/bury/cover method employed in Cameron Hills. Costs would include the drilling of deeper well(s) to identify a suitable disposal zone, the completion of the disposal well(s), the continuing operations of the disposal well(s), possible stimulations and workovers of the disposal well(s), and the maintenance and repair of surface equipment. With the mix/bury/cover method the drill cuttings are treated as necessary to meet regulatory guidelines, mixed with native soil, and buried.

IR Number 1.2.53 **(Source: KTFN)**

Preamble

Developing a sustainable KTFN economy through non-renewable resource development requires the extraction of the natural resources to occur over a sufficiently long period of time to allow the KTFN economy time to diversify into other areas besides non-renewable resource development.

In listing the factors that Paramount used in scheduling project activities, the development of sustainable local economies is not mentioned.

Request

Please provide the MVEIRB with the following information:

a) Confirm that the development of a sustainable KTFN economy is not a factor that Paramount considers when scheduling project activities.

Response

a) As outlined in the DAR section 4.1.4 page 101, the proposed scheduling addresses the overall disturbance footprint, delayed regeneration of habitat and extension of wildlife disturbances while still addressing economic considerations. Paramount does consider our commitment to utilize northern goods and services and personnel including those from KTFN.

IR Number 1.2.54 (Source: KTFN)

Preamble

Paramount has applied for land use permit and water license amendments from the Mackenzie Valley Land and Water Board. These amendments are for 5 new wells locations that replace five locations that were approved but will not be used. The amendments are also to re-locate the approved gathering system facilities, including pipelines, to connect with these five new wells. Those amendments are not included in the DAR.

Request

Please provide the MVEIRB with the following information:

a) If amendments are approved, will Paramount's impact analysis remain accurate?

Response

a) Yes. The amendments that Paramount has applied for are consistent in type and location with the project described in the original EA completed for the Cameron Hills Gathering System and Facilities (Golder and Alpine 2001).

Amendment components are considered to be comparable to previously approved project components because:

- Construction techniques and scheduling are the same;
- Mitigation techniques are the same;
- Construction will occur either on or adjacent to existing linear disturbances; and,
- All project components are within the same general project area.

The predicted disturbance for the amendments is less than the predicted disturbance in the original EA (Golder and Alpine 2001), let alone considering the cumulative effects assessment that was completed for the Planned Development Case discussed in the DAR.

The amendments proposed by Paramount are within ecological settings as described in the original EA. No new or unique habitat types are expected to be affected by the amended ROWs. No new environmental or socio-economic impacts are expected to occur as a result of the amended ROWs.

The amendments are reflective of the uncertain nature of the exploration and extraction of hydrocarbons. As more seismic data and drilling results are acquired, changes, most

of which are unforeseen, are inevitable. It is for this reason that Paramount has included estimates for potential future projects, recognizing that changes are likely.

References:

Golder Associates Ltd. and Alpine Environmental Consulting Ltd. 2001. Environmental Impact Assessment for the Cameron Hills Gathering System and Facilities Project. Prepared for Paramount Resources Ltd. 152 pp + Appendices.

IR Number 1.2.55 (Source: KTFN)

Preamble

Although Paramount does prominently not mention it, concern has been raised by the Ka'a'Gee Tu First Nation with the lack of consultation by Paramount with regards to environmental problems encountered by the project. For example, Paramount encountered significant problems with erosion and pipeline breaks but failed to inform the KTFN of these events or to involve us in discussions as to how these problems can be repaired and avoided.

Request

Please provide the MVEIRB with the following information:

a) Explain why Paramount chose not to consult with the KTFN about the erosion problems and pipeline breaks. Please note that the lack of a legislative or regulatory requirement to do so is not an acceptable response. Paramount can choose to consult in a manner that goes beyond the requirements placed on it by applicable legislation or the regulators.

Response

a) Paramount is not aware of erosion and/or pipeline construction and engineering expertise within the Kakisa community membership; therefore, contact was not made with Kakisa about these specific issues. A clear, defined regulatory and reporting procedure is in place relative to surface and operational issues, which Paramount has an obligation to adhere to. Paramount will consider providing operational updates in the Project Update document that is distributed to communities, governments and regulatory agencies.

IR Number 1.2.56 **(Source: KTFN)**

Preamble

Paramount has encountered significant erosion problems. None of the MVLWB, NEB, INAC or the GNWT ensured that the Ka'a'Gee Tu First Nation had been informed of these problems and involved in discussions on how to repair and avoid these problems.

Request

Please provide the MVEIRB with the following information:

a) *Explain why your organization did not consult with, or ensure that Paramount consulted with, the KTFN on the erosion problems encountered by Paramount. If the position taken is that your organization is not the organization responsible for informing the KTFN of environmental problems, then please identify the organization that is responsible for doing so.*

Response

This I.R. was addressed to INAC and GNWT.

IR Number 1.2.57 **(Source: KTFN)**

Preamble

Paramount has not concluded an impact and benefits agreement with the Ka'a'Gee Tu First Nation on the Cameron Hills project.

Paramount's response to IR 1.1.34 did not actually answer the questions that were asked.

Request

Please provide the MVEIRB with the following information:

a) Answers to the questions that were asked in IR 1.1.34

b) Paramount's view on the requirement for Paramount to negotiate an impacts and benefits agreement with the KTFN based on aboriginal and treaty rights and in accordance with recent case law. This agreement would be outside of the existing regulatory processes and along the same lines of, although at a different scale, as the IBAs that were negotiated for the NWT diamond mines.

Response

a & b) Please refer to the response for IR 1.2.23

IR Number 1.2.58 **(Source: KTFN)**

Preamble

In its response, Paramount provided reasons for why a hand-cut seismic program was rejected in favor of Vibroseis.

Request

Please provide the MVEIRB with the following information:

A comparison of Paramount's planned Vibroseis seismic program versus a hand-cut seismic program that includes at least the following information for each program:

a) total program cost;
b) personnel requirements and salary costs;
c) amount of disturbed areas; and
d) volumes of merchantable timber cut down.

Response

a) In the oil & gas industry, the interpretation of directed subsurface energy waves are used by geophysicists to determine the existence or potential of a hydrocarbon resource. The energy is directed downwards from a source at the surface, either by using explosives or vibration, and received at defined distances at a receiver, typically geophones and recording equipment.

The access to the source or receiver locations can be undertaken by either manual labour, that is hand cutting a line, or by mechanical means, using a tractor machine and operator or a combination of both. A source line and a receiver line may be hand cut or machine cut. The size of the line generated does differ according to the method used. A hand cut line can be as narrow as 1.5 m and a machine-generated line can be as wide as 5.5 m. In both cases, slashers are required to clean up the lines so that the cuttings lay relatively flat on the ground. For programs with narrow lines, helicopters are required to move equipment around since trucks can't be used.

A relatively new mechanical technique known as mulching uses a machine, which grinds the trees leaving behind a pile of bark mulch. This method is slow, line widths are typically 3 m, and little or no slashing is required.

Seismic operations in the Cameron Hills have been conducted during the winter period when ground conditions are conducive to travel. In a full helicopter supported seismic operation, drilling is done with heli drills and all recording equipment and manpower (drillers, surveyors and slashers) are moved in by helicopter. That type of program

would cost approximately 4 times the costs of a conventional program, which relies on various trucks and machine cut lines.

b) The one activity in a seismic operation that is labor intensive relates to slashing and cutting. A 200 km 3D hand cut seismic operation that is totally helicopter supported requires 750 person days whereas the same machine cut program will require 200 person days, a ratio of almost 4 to 1.

c) Given the same area for comparison, a heli-supported hand-cut seismic program would generate about one-third the amount of disturbed area, compared to a conventional seismic program.

d) Given the same area for comparison, a heli-supported hand-cut seismic program would result in approximately one-third or more of the volumes of merchantable timber cut down than would a conventional seismic program. However because of the narrow line width (1.5 m) timber salvage is not really feasible on hand cut lines.

If only large trees are defined as merchantable, current avoidance techniques with machine cutting, and certainly hand-cut would avoid most if not all large tree stands.

IR Number 1.2.59 (Source: KTFN)

Preamble

In its response, Paramount stated that: "...only impacts with a high Environmental Consequence rating have the potential to have significant adverse effects on the environment."

The objective of a quality environmental assessment process is not just to identify "significant" impacts but rather it is to identify and mitigate whatever adverse impacts will occur, regardless of whether or not they are deemed "significant".

Request

Please provide the MVEIRB with the following information:

a) *Rationale for Paramount's opinion that only impacts with a high consequence rating have the potential to have significant adverse impacts on the environment.*

b) *Confirmation that Paramount accepts the principle that all adverse impacts should be reasonably mitigated, not just those deemed "significant".*

Response

a) Paramount's opinion, quoted in the request, was in response to a question regarding whether or not the terms Environmental Significance and Environmental Consequence were being used interchangeably by the developer, and if not, to provide a rating scheme to relate Environmental Significance to Environmental Consequence.

It is Paramount's opinion that the terms Environmental Significance and Environmental Consequence are not interchangeable and a direct rating scheme to relate the two terms (Consequence and Significance) is not suitable. As described in Section 7.1.1.5.3 of the DAR, the impact rating system is used as a guide to facilitate a final assessment step in concert with professional judgment. Paramount has been careful to provide regulators and other document reviewers with details of the project, and/or the potential, as it relates to the Planned Development Case, and the anticipated effects, sufficient to draw their own conclusions with regard to impact significance.

Considering that the determination of significance relies not only on the nature of the impacts, but also the likelihood that the impact will occur. The likelihood that all of the direct and indirect impacts assessed in the Planned Development Case will occur is low. It is more likely that the development will be less extensive than what is reported in the DAR, i.e. fewer wells drilled and producing (e.g., 66% success rate to date), less production access, less production, and fewer air emissions.

It is Paramount's opinion that impact significance relates to the sustainability of an ecological or socio-economic receptor considering the project related residual impacts (i.e., the impacts that remain after mitigation has been implemented). Impacts with a negligible to moderate Environmental Consequence would not have a sufficient combination of magnitude, duration, frequency, geographic extent and reversibility to cause a significant adverse effect on the sustainability of a particular ecological receptor. It is Paramount's opinion that only high consequence impacts have the potential to adversely affect sustainability.

Paramount has stated that their environmental impact assessment indicates that the adverse environmental impacts potentially resulting from the Cameron Hills Extension project will not result in significant adverse environmental effects. Further, Paramount has followed the environmental assessment process as outlined by the Canadian Environmental Assessment Agency (CEAA) in that it has presented sufficient information to allow regulatory agencies to make a determination of impact significance. Two major CEAA concepts of impact significance determination are as follows:

- CEAA describes "Significance" as follows: *"The major outcome of an EA is to determine whether or not a project is likely to cause significant adverse environmental effects. The significance of the environmental effect is determined by a combination of scientific data, regulated thresholds, standards, social values and professional judgment. It must be determined in a transparent, systematic and supportable fashion." (http://www.ceaa-acee.gc.ca/999/index_e.htm#9, Question 9)*

- In its description of the basics of Environmental Assessment, CEAA states: *"Based on the findings of the assessment, it is the Responsible Authority's decision as to whether adverse environmental effects are likely to be significant." (http://www.ceaa.gc.ca/010/basics_e.htm)*

For further definition of significance and the process for the determination of significance, the reader is referred to the CEAA Reference Guide "Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects" (*http://www.ceaa-acee.gc.ca/013/0001/0008/guide3_3.htm).*

b) The Environmental Consequence rating and the Impact Significance determination is based on an assessment of residual effects. These are the effects that are predicted to remain after the implementation of mitigation measures. In order to assess the residual effects, Paramount has explicitly demonstrated their acceptance of the principle that adverse impacts should be reasonably mitigated throughout the DAR, in addition to previous EA's on which this DAR is based, by outlining the mitigation to be implemented throughout the life of the project. In addition, Paramount has stated that it will use adaptive management practices to address adverse effects of their project using current technology. It should also be noted, however, that the DAR focused on the cumulative effects of several development cases, and not just individual impacts.

IR Number 1.2.60 (Source: KTFN)

Preamble

In its response to IR 1.1.9, Paramount provided its reasons for assigning a negative value (i.e. beneficial) to reversible impacts.

Paramount's reasons do not provide valid justification for its reversibility scoring system. Using that system, an adverse impact can be rated as a net benefit to the environment. For example, an adverse impact with negligible magnitude, immediate duration, low frequency and local extent would be considered a net benefit to the environment with a total score of –3 just because the impact was reversible.

In a valid scoring system, no adverse impact can achieve a score lower than 0, with a score of 0 acknowledging that the adverse impact exists but that it can be considered negligible.

A valid approach for scoring reversibility is as follows:

- *0 points - Reversible in the immediate term (< 30 days)*
- *1 point – Reversible in the short term (30 days to 1 year)*
- *2 points – Reversible in the medium term (1 to 20 years)*
- *3 points – Reversible in the long term (20 to 100 years)*
- *5 points – Irreversible or reversible far future (> 100 years)*

Note that the suggested score of 5 for "Irreversible" is not a mistake. The difference between a long-term reversible impact and an irreversible impact justifies the increase from 3 to 5 points.

Request

Please redo and resubmit Section 7 of the DAR using the above approach for assigning scores for reversibility.

Response

a) As is described in section 7.1.1.5 of the DAR, the approach used to assess Environmental Consequence of the potential impacts should be considered a guide to facilitate the final assessment step. There are numerous methods that can be used by an environmental practitioner to quantitatively assess the predicted effects of a project.

The method suggested by this request links Duration and Reversibility. If one was to use this system of analysis, assigning a numerical value to both reversibility and duration would effectively double count the effect of an impact. Therefore either the

score for reversibility (the last column in Table 7.1-1) should be removed, or a re-evaluation of the total value required for each of the Environmental Consequence determinations would be required. One cannot simply reassign numbers to any of the impact criteria without assessing the effect of that change on the overall rating scheme.

The impact assessment methodology/approach used in the DAR is valid and is the result of rigorous review by:

- territorial regulatory agencies (e.g., MVLWB, MVEIRB, Inuvialuit-Environmental Impact Screening Committee),
- federal (e.g., Environment Canada, National Energy Board, Department of Fisheries and Oceans, Canadian Environmental Assessment Agency, Department of Indian Affairs and Northern Development, Indian Oil and Gas),
- provincial (eg. Alberta Environment, Saskatchewan Environment and Resource Management), and
- numerous other stakeholders,

for past large, medium and small scale projects. The approach presented in Paramount's DAR is the Developer's assessment of the project related impacts and, as such, a reassessment is not appropriate. Paramount has provided details of the current project and their estimations of future activities in the Cameron Hills, which would allow other reviewers the information required for them to implement their own systems of impact analysis, as appropriate.

IR Number 1.2.61 **(Source: KTFN)**

Preamble

Paramount provides its view of the requirements of the GNWT handbook on constructing winter roads.

Request

Please provide the MVEIRB with the following information:

a) GNWT's evaluation of Paramount's response to IR 1.1.28

Response

This I.R. was addressed to the GNWT.

IR Number 1.2.62 (Source: KTFN)

Preamble

Paramount says that it does not have the authority to deny access to the winter road to any member of the public.

Request

Please provide the MVEIRB with the following information:

a) *A description of Paramount's authority to prevent public use of the winter access roads into and within the Cameron Hills project area.*

b) *If Paramount does not have the ability to prevent public use of its access roads, then please explain whether or not INAC or another organization does.*

Response

This I.R. was addressed to INAC.

IR Number 1.2.63 (Source: KTFN)

Preamble

Paramount adjusted all hourly mixing heights in the data set that were less than 95 m up to 95 m.

Request

Please provide the MVEIRB with the following information:

a) The rationale for adjusting the hourly mixing heights to 95 m.

Response

a) The Fort Smith meteorological data set used in the air quality assessment was generated from hourly surface observations combined with twice daily upper air soundings. The hourly mixing height values were generated using the PCRAMMET meteorological pre-processor, which has been identified to yield unreasonably low mixing heights (i.e., < 1 m) when applied to soundings at northern latitudes. This finding was raised in a report commissioned Environment Canada to compute and analyze mixing heights for 102 stations in Canada and the United States (SENES 1996). The lowest mean monthly minimum mixing height calculated for Fort Smith was 95 m; therefore, all mixing heights less than 95 m in the generated data set were set to 95 m to match this finding. Overall, this adjustment affected approximately 2% of the hours.

Were these corrections not applied, the modelling could have provided unrealistic and non-representative results for those hours with very low mixing heights. It should be noted that the ISC3 dispersion model used in the evaluation of the Cameron Hills expansion does not allow plumes released above the mixing layer to effect ground-level concentrations. By adjusting the minimum mixing heights to 95 m, the ISC3 will correctly model ground-level concentrations during the early morning hours when mixing heights are expected to be at a minimum.

Reference:

SENES Consultants Limited. 1996. A Mixing Height Study for North America (1987-1991). Prepared for the Atmospheric Environment Service.

IR Number 1.2.64 **(Source: KTFN)**

Preamble

Paramount did not include odor or visibility among its key indicators of air quality.

Request

Please provide the MVEIRB with the following information:

a) An analysis of the potential direct impacts on the air quality indicators odor and visibility and,

b) The potential indirect impacts on receptors such as humans and wildlife.

Response

a) While Section G-1 of the project Terms of Reference does not explicitly identify the need to evaluate the direct impacts of the project on odours and visibility, these were covered through the key indicators used in the air quality assessment. For example, odours were evaluated through the use of hydrogen sulphide (H_2S) as a key air indicator. This compound will be the primary source of potential odours emitted from the Cameron Hills operations. The maximum predicted H_2S ground-level concentrations for the Baseline, Application and Planned Development Cases were 4.8, 4.8 and 4.9 $\mu g/m^3$, respectively. These maximum concentrations are below the accepted odour threshold for H_2S of 14.1 $\mu g/m^3$. Therefore, there should be no noticeable odour impacts. However, the impacts associated with detectable odours are highly personal and subjective.

Emissions from projects similar to the Cameron Hills Expansion can affect visibility in two ways, namely:

- are the facilities visible; and
- will the emissions from the project contribute to regional haze and degrade visibility.

Whether the facilities are visible is dealt with directly in Section 7.12 of the DAR, which looks at aesthetics. The reviewer is directed to this section of the report for a discussion on direct visible impacts.

The indirect effect of emissions from the Cameron Hills expansion on regional haze is related to the expected changes in fine particulate ($PM_{2.5}$) concentrations, including both primary particulates (i.e., $PM_{2.5}$ that is directly released from the project) and secondary aerosols (i.e., $PM_{2.5}$ that forms in the atmosphere as a result of gaseous

emissions [e.g., SO_2 and NO_X] from the project). However, $PM_{2.5}$ levels in the Cameron Hills area are not expected to experience measurable changes as a result of the project. The Cameron Hills Expansion project is expected to result in 0.0076 t/d of direct $PM_{2.5}$ emissions (see Section 7.2.5.2.3 of the DAR), which equates to expected 24-hour $PM_{2.5}$ concentrations less than 1 $\mu g/m^3$. The secondary aerosol levels are expected to be lower, since the combined SO_2 and NO_X emissions are less than 2.5 t/d. In the Athabasca Oil Sands Region of northeastern Alberta, secondary $PM_{2.5}$ levels of 8 $\mu g/m^3$ have been associated with combined NO_X and SO_2 emissions of 580 t/d, almost 300 times the emissions in the Cameron Hills area.

b) In section 7.2.1 of the DAR it is stated that "*The focus of this air quality assessment is on determining changes to the composition of the air and comparing the results with NT standards or existing regulations and guidelines from other Canadian jurisdictions..*" Therefore, it would not have been appropriate to assess impacts to humans and wildlife in the air quality section of the DAR.

In the event that the air quality assessment had predicted impacts of a high magnitude, this data would have been passed to other disciplines (e.g., wildlife) where the effects on the receiving environment were evaluated.

IR Number 1.2.65 (Source: KTFN)

Preamble

In Table 7.2-7, Paramount explains how it assigned magnitude scores for the air quality analysis. The approach used by Paramount unjustifiably applies qualitative scores in a situation in which quantitative scores are easily possible.

Instead of the process used by Paramount, the Low and Moderate columns of Table 7.2-7 should just be deleted. The High column can remain as is with 15 points pegged as the value at which air quality guidelines are equaled. The modeled air quality values can then have calculated magnitude scores that start at 0 (no increase in emissions) and increase as appropriate.

For example, the following 1-hour SO_2 values would have the calculated magnitude scores as follows:

- *300 $\mu g/m^3$ – 10 points*
- *450 $\mu g/m^3$ – 15 points*
- *600 $\mu g/m^3$ – 20 points*

The process used by Paramount produces artificially low magnitude scores as long as the air quality guidelines are not exceeded. For example, a 1-hour SO_2 value of 440 $\mu g/m^3$ would only have 5 magnitude points with an increase of only 20 $\mu g/m^3$ to 460 $\mu g/m^3$ increasing the magnitude score to 15. In this manner, the total environmental consequence scores are kept low as long as the air quality guidelines are not exceeded. This is not an acceptable method of conducting an EA. If it were, all that would ever be required would be to compare emissions levels to guidelines and all other EA factors would be meaningless.

Request

Please redo and resubmit the air quality section of the DAR using magnitude scores calculated as described above.

Response

In completing the air quality assessment of the Cameron Hills Extension project, the authors applied an evaluation approach to classify environmental consequence that was clearly set out, consistent and, in the professional opinion of the authors, appropriate for use on this assessment. The air quality assessment also included all of the necessary information to allow the reviewer to apply an alternative evaluation approach themselves. However, the authors continue to believe that the approach they applied in the DAR was the most suitable and appropriate.

IR Number 1.2.66 **(Source: KTFN)**

Preamble

Transportation emissions, such as from trucks and ATVs, do not appear to have been included in Paramount's air quality modeling.

Request

Please provide the MVEIRB with the following information:

a) an air quality analysis, which includes transportation emissions.

Response

a) Section G-1 of the project ToR does not explicitly indicate the need to evaluate the emissions from transportation sources, which were considered to be minor compared to the operating emission sources that were included in the air quality assessment presented in the DAR. The following lists the transportation equipment associated with operations at Cameron Hills:

- 3 Honda ATVs;
- 4 Polaris snowmobiles;
- 1 helicopter on site for approximately 1.5 hours/day between April 15th to November 15th;
- 1 Ford F150 truck; and
- 1 ¾-Ton Chevrolet truck.

Since these vehicles will have to meet applicable federal emissions standards, emissions will be kept to a minimum. In addition, these small, intermittent sources of emissions would only have a temporary, localized and intermittent effect on the air quality. Therefore, transportation sources would have had no effect on the predicted ground-level concentrations and were not included in the air quality assessment.

IR Number 1.2.67 **(Source: KTFN)**

Preamble

Paramount did not provide the information requested by IR 1.1.10(b).

Request

Please provide the MVEIRB with the following information:

a) further response to the information requested by IR 1.1.10(b).

Response

a) Paramount and its consultants do believe that they responded appropriately to the original IR 1.1.10; therefore, additional dispersion modelling to evaluate the Potential Acid Input (PAI) levels is not warranted for this development. The reviewer is also directed to the response to IR 1.2.128, which responds to the MVEIRB requests regarding the possible need for additional monitoring of acid deposition. It should be noted that the MVEIRB accepted Paramount's position that PAI modelling was not required for the Cameron Hills Project.

IR Number 1.2.68 **(Source: KTFN)**

Preamble

Paramount refers to a permafrost monitoring report, which is understood to also include revegetation and access monitoring.

Request

Please provide the MVEIRB with the following information:

a) A copy of this report or a more recent version, if available.

Response

a) Copies of the Golder report "Cameron Hills Gathering System and Transborder Pipeline Right-of-Way 2003 Revegetation, Permafrost and Access Monitoring" were distributed on November 12, 2003 to several government agencies and First Nations communities including the Ka'a'gee Tu First Nation and their solicitor (Constance Macintosh of Mindell Pinder). An additional copy of the above mentioned report is being submitted to the MVEIRB for their public registry in support of this EA.

IR Number 1.2.69 **(Source: KTFN)**

Preamble

Paramount has had pipeline breaks in the last couple of years.

Request

Please provide the MVEIRB with the following information:

a) All relevant information regarding the pipeline breaks including the following:

i) the locations
ii) the causes
iii) the extent of hydrocarbon contamination including volumes spilled
iv) clean-up and repair activities; and
v) prevention measures that have been developed

b) Include copies of all reports that were completed as a result of these pipeline breaks

Response

a) i) The locations of all pipeline breaks to date have been adjacent to pipeline anchors at risers. The pipeline break in 2002 occurred on the C50 pipeline just upstream of the anchor before the river crossing. The pipeline breaks in 2003 occurred on the H03 battery site, at the anchor adjacent to the battery inlet header.

ii) The cause of all failures was excessive pipe stress arising from inadequate support of the pipelines in the pipeline trench.

iii) The volume of liquid spilled was never determined in the case of the C50 line break, but was estimated to be less than 0.5 m^3. No contaminated soil was recovered. Clean-up was completed by replacing the broken pipe and backfilling with soil from the excavation.

In the case of the K74 and C74 line breaks on the battery site, an estimated 39 m^3 of oil was spilled which ultimately contaminated approximately 1500 tonnes of soil. The free oil was vacuumed up, mopped up and recovered to the battery tanks. The contaminated soil was recovered and transported to a disposal and treatment site in Hay River.

In neither case was spill effluent discharged into flowing surface water off the right-of-way or battery site.

iv) In all cases, repairs were effected by replacing the defective pipe, and providing adequate support. The clean up at H03 was affected by vacuuming or soaking up free liquid, and recovery of contaminated soil. In the C50 case, no free hydrocarbon was present.

v) In the case of the C74, K74 pipeline breaks, all construction completed that season was inspected for similar installation deficiencies. One other poorly supported pipeline, also at an anchor, was found on the D49 wellsite. The pipeline has been disconnected and is isolated.

Paramount has engaged a third party to conduct a general and exhaustive review of pipeline anchor designs and installation specifications. New standards have been developed for implementation in future work to prevent like failures.

b) Paramount tracks spills internally and reports spills in the NWT to a government agency no matter what quantity or type of spill. The Environmental Protection Service of RWED records those spills on their Hazardous Materials Spill Database including the above two mentioned pipeline breaks. (see IR. Number 1.2.69 for a listing of all spills in the Cameron Hills). The NEB is the lead agency for all pipeline incidents and all reports associated with these incidents including the information asked for in item a) above were filed with that agency and INAC have a regulatory role in terms of remediation.

IR Number 1.2.70 **(Source: KTFN)**

Preamble

Paramount does not discuss what measures are in place to ensure the pipelines, including the product in the pipelines, do not alter the thermal regime of the soil and cause permafrost degradation.

Request

Please provide the MVEIRB with the following information:

a) Describe the measures that are in place to ensure the pipelines, including the product in the pipelines, do not alter the thermal regime of the soil and cause permafrost degradation.

Response

a) The gathering system is designed and built to operate at normal ground temperature without the addition of heat.

Indeed, some gas wells are equipped with heaters. These are, however, used only to provide an operable transition from high flowing wellhead pressures, where the formation of hydrates at ambient temperatures is possible, to the lower gathering system operating pressure where the formation of hydrates is less agressive. By operating the gathering system at lower pressures, use of chemical hydrate inhibitors is reduced to manageable levels. The heater is only required to overcome the Joule-Thomson cooling effect arising from the abrupt pressure reduction from wellhead to gathering system-operating pressure.

Paramount has undertaken a permafrost-monitoring program. To date no significant impact to permafrost has been noted.

A copy of Golder Report "Cameron Hills Gathering System and Transborder Pipeline Right-of-Way 2003 Revegetation, Permafrost and Access Monitoring" is being submitted to the MVEIRB for their public registry in support of this EA.